

SUPPLEMENT.

The Mining Journal, RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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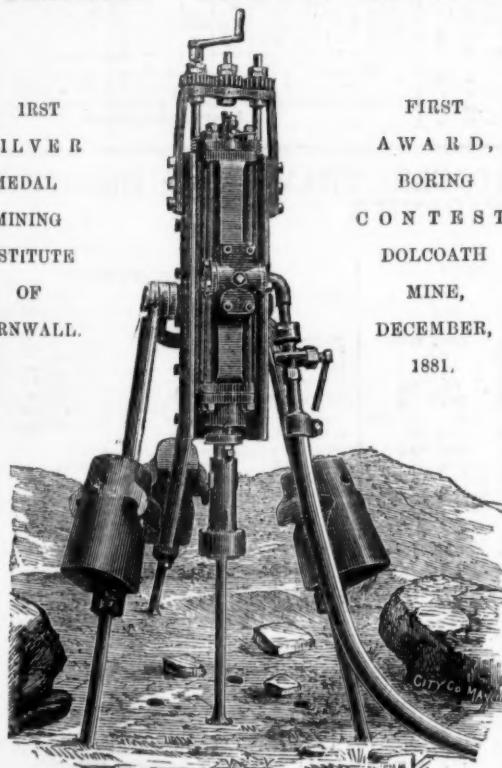


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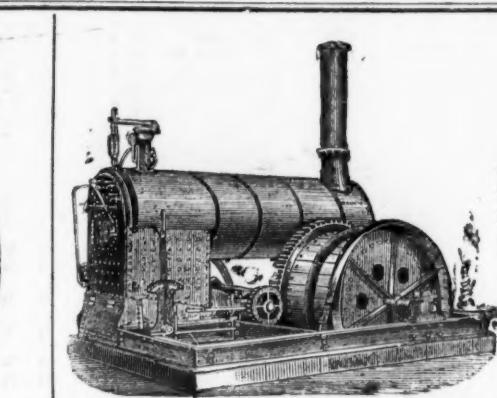
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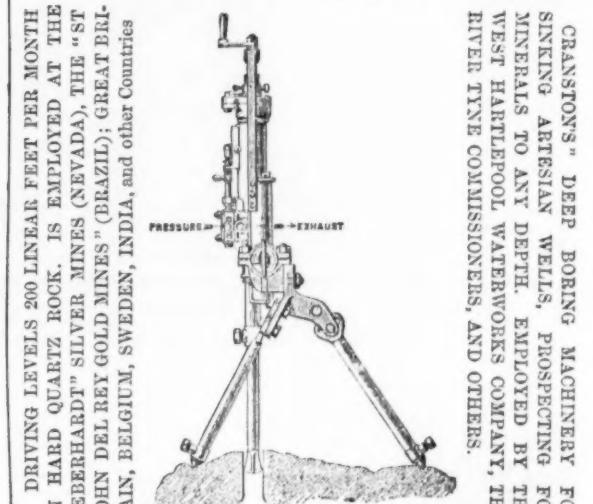
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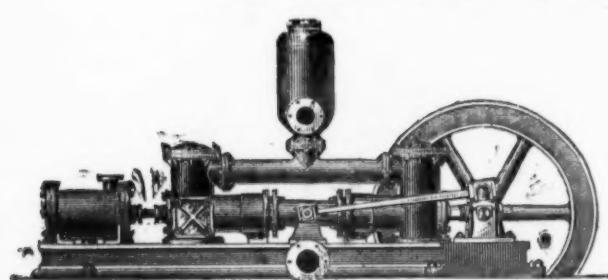
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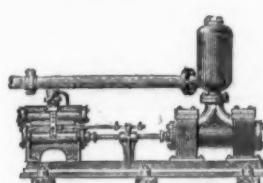
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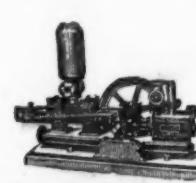
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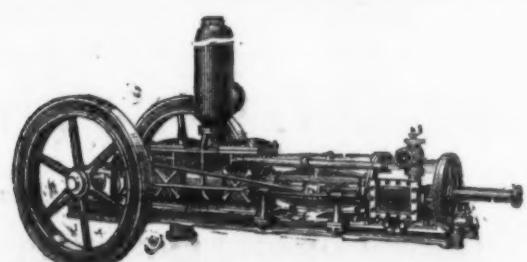
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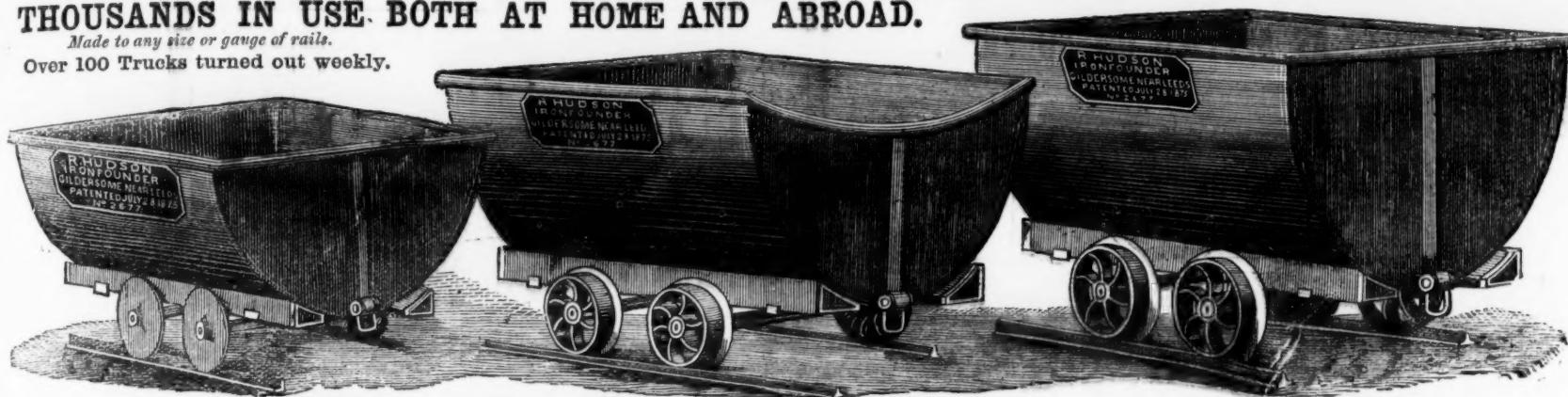
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This is the best and most economical Piston Packing in the market for High and Low Pressure Stationary Engines. Of course there are many worthless imitations of a Packing so universally approved of, but I am the Original Maker and Sole Manufacturer of the genuine article, as used in the British and German Navies. To avoid imposition, users should require to see my Trade Mark, which is on every 10 feet length of the Packing made by me, and without this none is genuine.

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JOHN BELL, Esq.—Sir, I have great pleasure in reporting on your Asbestos Cloth Rope Packing which you sent me on trial. I tried it in one of two H.P. Piston Rods, and it ran 90 days without repacking. The other H.P. Piston Rod was packed with a similar form of packing, not composed of Asbestos, and was repacked 10 times during the 90 days. I have recommended it both at Sydney and Melbourne, and shall do my best to take this packing in whatever steamers I may have to do with.

I remain, Sir, yours truly,

W. W. PROPHET, Chief Engineer S.S. "NORFOLK."

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For making every class of steam and water joint. It can be bent by hand, without puckering, to the form required, and is especially useful in making joints of manhole and mudhole doors; for this latter purpose it is kept in rolls of 100 feet, in various widths from 1 inch to 2½ inches wide, by ¼ inch to ½ inch thick. Manhole cover joints made of this material can be lifted 20 times before renewal is necessary. This material is also made in sheets about 40 inches square, from ¼ inch thick upwards, and each sheet bears my Trade Mark to protect users against imitations. Every 10 feet length of the tape has a label attached bearing my Trade Mark, and users are requested to see that this label is attached to prevent imposition by worthless imitations.

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For Coating the Boilers of every kind of Marine and Stationary Engine. It is non-combustible, and can be easily and quickly applied at any time whether steam is up or not. It adheres to iron and metals and preserves them from rust. The following Testimonial refers to the Asbestos Boiler Covering Composition:—

Mr. John Bell, 118, Southwark-street, S.E.

The Maxim Weston Electric Company (Limited), 29, Bankside, S.E., London, 4th January, 1883.

DEAR SIR.—In answer to your request, I beg to inform you that I find the thermometer placed 3 feet above the boilers now stands at 93°; before your covering was put on it used to stand at 128°. With regard to the saving in fuel I am unable to speak very accurately, as the boilers were not working long enough before being covered to ascertain the amount of fuel that would be consumed in an ordinary run; but I feel quite justified in saying that we burn less by about 5 cwt.s. per night than we were doing, and I shall be glad at any time to show the boilers to any one who may wish to see them, as I consider yours the best covering that I have up to the present seen.

Yours faithfully,

(Signed) J. H. CUNDALL, Works Manager.

BELL'S PURE CLOSELY WOVEN ASBESTOS CLOTH

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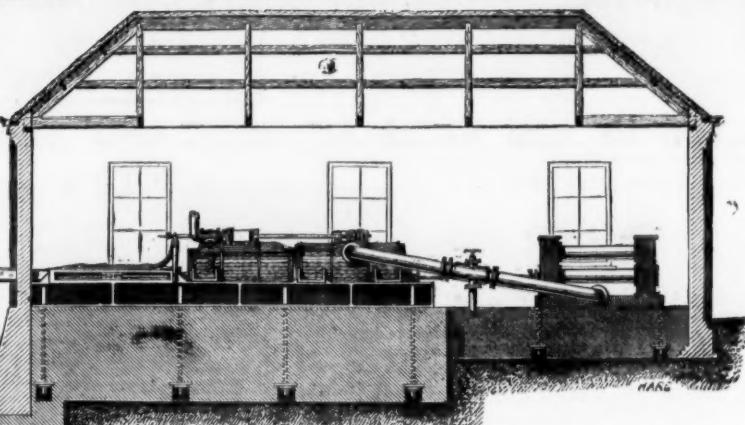
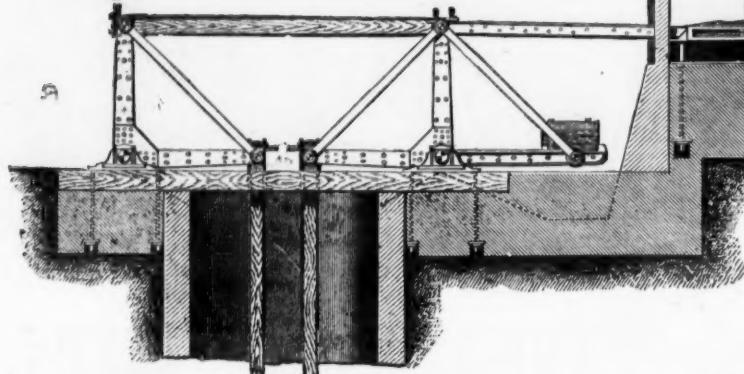
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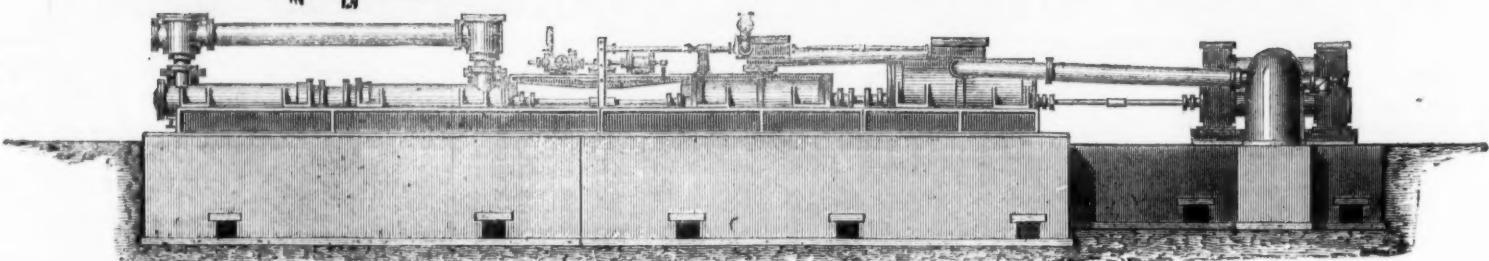
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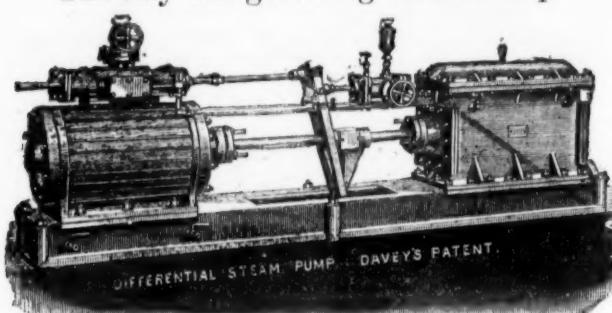


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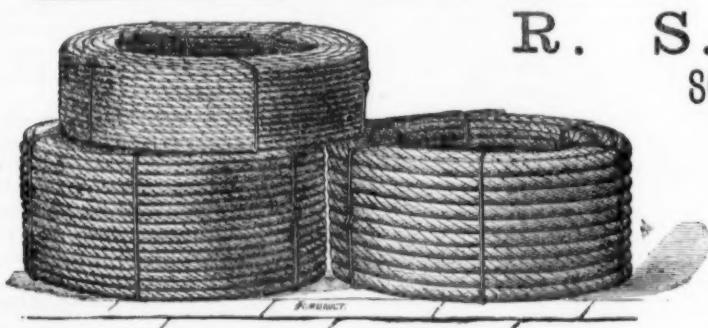
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12	6	24	6,500	250	90	104	130	4½	2	2½
12	7	24	10,500	180	96	110	136	5	2	2½
12	8	24	13,500	140	100	114	142	6	2	2½
12	10	24	21,300	90	120	136	175	7½	2	2½
14	7	24	10,400	250	110	130	156	5½	2	3
14	8	24	13,500	190	120	145	165	6	2	3
14	9	24	17,300	150	130	150	172	6½	2	3
14	10	24	21,300	120	140	162	190	7½	2	3
14	12	24	30,800	80	160	190	216	9	2	3
16	8	24	13,700	250	140	170	195	6	3	3½
16	9	24	17,300	200	150	180	215	6½	3	3½
16	10	24	21,300	160	160	196	225	7½	3	3½
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TECHNICAL EDUCATION AT KING'S COLLEGE.—The evening students resumed their duties in the workshops at King's College on Tuesday evening under the superintendence of Mr. David Walker, M.I.M.E., and from the number of entries, the practical and useful character of the instruction given appears to be widely appreciated. Among the recent additions to the machine tools and instruments a new testing machine by Greenwood and Butler, of Leeds, presented by the Clothworkers' Company, is a special feature. The entire staff of the workshop instructors attend in the evening for Carpentry, Cabinet Work, Fitting and Turning in Metal, and special instructors are retained for Turning in Wood and Ivory, and for Smiths' Work, plain and ornamental. The workshops are also fitted with the necessary appliances for Moulding and Casting in Brass and Iron, Brazing and Soldering, and special instructors are retained on five students entering to form a class for such subjects. It is explained that the course of work is designed to illustrate the theory of construction, and to develop the technical and mechanical skill required in Building and Engineers' Work, and is adapted for students of Engineering and Architecture, Amateurs, Gentlemen preparing for Colonial life, and so on. The Clothworkers' Company give an annual prize of 5*l.* in books for excellence in Woodwork, and another of 5*l.* for excellence in Metal Work, open to all evening class students attending three terms in the year. General and special Certificates of Merit are also awarded for the work of the students. Many of the students appear to be making excellent progress, and there can be no doubt that the course must prove valuable to all connected with mechanical matters, whether directly or indirectly.

Original Correspondence.

SOUTH AFRICAN DIAMOND INDUSTRY.

SIR.—As you can well understand that this industry, in which I am deeply interested, is as yet but little understood here, I shall feel much obliged if you reprint the subjoined remarks from the Money Article of the Daily Telegraph and my reply thereto. The writer says:—

From the South African papers recently to hand we learn that the state of the diamond mining industry was engaging considerable attention in the Kimberley and other districts. For various reasons—the chief of which appear to have been the excessive prices paid for claims, injudicious working, litigation, high local rates, and a fall in the market value of diamonds—some mines had stopped altogether, and complaints of depression were general. The favourite remedy advocated was amalgamation, with the double object of reducing the expenditure and so regulating the output of diamonds as to raise their price. This question had been brought into special prominence by a meeting of representatives of the Dutoitspan companies, convened by Mr. Gansl, stated to be the agent of Messrs. Rothschild, who was present, and made a speech strongly urging amalgamation. He gave it as his opinion that very valuable properties were being rendered worthless by the system of working in rogue; but the Dutoitspan Mine, he added, was undoubtedly of enormous value, and it rested with them to adopt some plan by which they could reap the benefit of their investments, bearing in mind that it must rest on such a basis as would induce London capitalists to co-operate. The meeting passed resolutions endorsing these views, declaring in favour of a consolidation of the various interests in the Dutoitspan Mine, and appointing a committee to take the necessary measures. The tone of local comment was strongly in favour of amalgamation, but it was pointed out that a scheme of such dimensions would require nearly a million sterling to carry through:

From this estimate, applying to only one group of mines, some idea may be formed of the magnitude of the diamond industry. Another proof of its importance is afforded by the report of the Kimberley Central Diamond Mining Company (Limited) for the quarter ending Oct. 31 last, which was received by last mail. This company has a capital of £56,860., and is assessed for rating purposes at £59,770. 8s. It has been in existence about three years, and has produced in that time 482,924 carats of diamonds, valued at £14,797. 7s., paying in dividends and bonus a total of £26,796. 12s., or, including the balance carried forward, a sum equal to its capital stock. The account for the quarter ending Oct. 31 last shows a net profit, after paying all expenses—which include £48,184. 7s. 6d. for rates—of £14,931. 19s. 7d. The diamonds sold realised £143,981. 7s. The disposable total was £105,523. 5s. 5d., out of which a dividend of 12½ per cent. was declared, and 20,000. added to reserve, leaving in hand £33,415. 15s. 5d. In addition there was 81,632 loads of blue ground on the "floor," which appear to be worth about 2½ per load, or, as explained by the Chairman at the meeting of shareholders, a 32½ per cent. dividend had really been earned for the past two quarters. It would seem from this that the industry rightly conducted yields enormous profits, and that there is some reason in a movement for amalgamation which would make other properties equally lucrative. None of the shares of the companies mentioned are negotiated in this market except privately, the shareholders being either residents in South Africa or returned colonists living in London. These latter, however, in the case of the Kimberley Central, are numerous enough to press for the establishment of a London office, agent, and registry, and a special meeting was to be called to consider their request."

In my reply I stated that with regard to the remarks on the proposed amalgamation of the diamond mining companies of Dutoitspan, and also on the report of the Kimberley Central Diamond Mining Company, the following observations may be of interest to your readers, as these companies and the industry generally are hardly understood in England. In the first place, the mines themselves are distinct diamondiferous deposits, or, as they are called, volcanic pipes, and have individual characteristics both as to size and value, and even as to the diamonds themselves. There are several companies in each mine, and the yield of their properties varies from as much as 42. in some cases to as many shillings per ton in others. This shows how necessary it is for investors to obtain reliable information; and the confusion is further increased by companies in two or more mines having adopted the same names—the British, the Central, the Standard. The success of the first companies, which were formed more for the sake of economy in working and better management than from any wish on the part of the claimholders to sell out, led to a reckless formation of companies, wild speculation, and an ultimate reaction. One great cause of the present depression which you seem to have overlooked may be found in this fact, that all companies, both good and bad, at once imported large quantities of machinery, in some instances with borrowed capital, the result being that an outlay of many hundred thousand pounds in less than two years by so limited a community has helped to cause the present scarcity of money in Kimberley. With regard to the latter portion of your article—the report of the Kimberley Central Diamond Mining Company—I would mention that other companies in the Kimberley Mine have, since their formation during the last three years, paid regularly very large dividends, although burdened with very heavy rates which, in the case mentioned, the Central, would amount to 144,000. per annum. The manager of this company, in his evidence before the assessment court, gave it as his opinion that the bulk of the work for which these heavy rates are levied is nearly completed. Better modes of working, or general amalgamation of the companies in the mine, would it is the general opinion, have the effect of at once greatly reducing the present enormous expenditure. To conclude, you have only to compare the export of diamonds with that of the other productions of the Cape Colony to realise the dimensions which this industry has reached.

Richmond, Jan. 13.

CANTAB.

INDIAN GOLD MINES—SHAREHOLDERS' ASSOCIATION.

SIR.—I observe a letter in last week's Journal recommending the formation of a Shareholders' Association in connection with the Indian gold mines. I suggested that idea myself in the *Mining Journal* for Oct. 21, 1882, and am glad to find that some one else has seen the advisability of such a course being adopted. I only hope it may become an accomplished fact, for, depend upon it, the stricter watch we keep upon our properties, and the more we make our power unitedly felt by the boards of direction, the better it will be for the whole industry. A few shareholders in each concern, I do not doubt, take a great interest in what is going on, but those isolated few cannot exercise much influence in the same way that an official body like the permanent committee of a Shareholders' Association could do, who are always on the watch, continually getting information as to what is going on at the mines, and always ready to act at a moment's notice in the interests of the whole shareholding body. I think the mere existence of such an Association would have a salutary influence all round.

It is a very bad feature in foreign mining that directors are so much at the mercy of their manager at the mines, and, although your correspondent, Mr. Greenway, defends Mr. Moore, the resident manager of the Indian, Kingston, and Sandhurst Gold Mining Company, I venture to say there is just cause for censuring that gentleman, and that on your correspondent's own showing. He says—"Allow me to state, as my experience of travelling through Southern India, the prevailing impression is almost universal that these mining companies are very little better than associations undertaken by clever promoters to catch the money of the unwary." This means, if it means anything, that these mines are valueless, and I presume that Mr. Greenway would not have penned that sentence if his experience in India had not confirmed the local opinion. Why, then, in the name of common sense, should Mr. Moore have put the company to the enormous expense of erecting a 20-head Californian mill to crush worthless stone. He is, I suppose, an experienced gold miner. Surely, then, that experience should have taught him whether or not the indications were such as to justify him in sinking

thousands of pounds in the erection of an expensive mill. Why could he not have done what the Wentworth Gold Mining and Indian Estates Company are doing—put up a little and comparatively inexpensive mill of three, four, or five stamps to test the quartz from various portions of the estate. Should the quartz on all the estates of the Wentworth Company prove worthless the directors have at least the satisfaction of knowing that the experiment has not cost much.

Mr. Greenway ends his communication with an extract from a letter, which he states, appeared in the South of India Observer for Nov. 25. That letter, however, really appeared in the *Mining Journal* for Oct. 21, 1882, and was written by me. Probably it may have been copied into the Indian paper. As he has been into the very heart of the Wynnaad mining district cannot he favour all of us shareholders with his own experience and opinion of the gold fields, instead of reserving them for an investigation committee, which may never be formed? We should feel very grateful to him, being, as we are, in such a state of suspense—hoping to-day and fearing to-morrow. Your correspondent has been at Pencular, he tells us, and as that village or town is on the estate of the Indian Phoenix Gold Mining Company he will be in a position to say what the prospects of that undertaking are, and what his opinion (as well as the local opinion) of Mr. Grove is as a manager and gold miner. At the risk of repetition, I say again that we Indian gold mine shareholders would be very grateful if we could be favoured with a summarised opinion, through the columns of the *Mining Journal*, of each of the principal gold mining estates he has visited, and of the manager in charge of each, especially of the latter, as I am firmly impressed with the conviction that too much importance cannot be attached to the integrity and ability of the men on the spot in whose hands are placed our fortunes for weal or woe. Will Mr. Greenway kindly do this?

YORK, Jan. 15.

J. M.

THE TRANSVAAL GOLD FIELDS.

SIR.—Your Kimberley correspondent writes in last Saturday's Journal—"There is gold in the Transvaal, but I challenge any person to point out any placer ground in that province." But in the Journal of Nov. 25 he says—"The Spitzkop contains four placers that are worth working, and in two the prospects are fairly good." He living 600 miles away from the Transvaal gold fields, and receiving information from others, it is not to be wondered he makes a mistake; but under his challenge, I now ask him which of his accounts about placers he maintains as correct. At least six companies have been formed now to work the large area of the Lydenburg gold regions, and as many competent men have been dispatched there within the last few weeks, it will not be a long time before authentic reports about these gold fields will be sent home.

ARGUS.

HATTON GARDEN, Jan. 16.

MINERAL RESOURCES OF NEW MEXICO.

SIR.—In writing a series of letters descriptive of the mining camps of this territory, I have thought it advisable to make this—the first of the number—more of an explanatory than of a descriptive character. The territory of New Mexico lies between the 31° and 37° of north latitude, and between 103° and 109° of west longitude; and owing to its location it possesses superior climatic advantages as a mining country, there being no portion of it, except the extreme north-west, where mining operations cannot be carried on all the year round. For the purpose of this correspondence, the surface may be classed as consisting of Government Land, Confirmed Grants, Unconfirmed Grants, Indian Reservations, and Military Reservations; and it may be well to give a brief explanation of the status of each of these divisions, so far as the mining interests of the territory are concerned.

1. *Government Land*.—This, as in all the territories, is open to the public, and it can be pre-empted as agricultural land or grazing land, or located as mineral land.

2. *Confirmed Grants*.—These are lands which have had the title granted to the original holders by the Mexican Government, confirmed by the United States, as agreed upon at the Treaty of Guadalupe Hidalgo, when New Mexico was ceded to the United States. As it has been a vexed question as to what the confirmation by the United States really conveyed, it may be as well to state here that the Mexican grants were, as a rule, for agricultural and grazing purposes only. The title to the minerals remaining (as in Old Mexico to-day) in the Government, hence at the treaty above named the minerals became vested in the United States, and if in those cases where the title has been confirmed the United States had merely given deeds, confirming the holders in their Mexican titles, then the minerals would still have remained vested in the Government, but instead of doing this in all cases where the United States has confirmed the titles it has done so by specifically assigning all its right title and interest in the land covered by the grant, thus divesting itself of any mineral rights it possessed, and vesting the same in the grantees. This has been largely misunderstood, and has led to considerable litigation by those who claimed that the confirmation merely carried with it what was in the original grant, but it has definitely been decided by the Supreme Court that the minerals went with the confirmation.

3. *Unconfirmed Grants*.—These remain as at the time of the treaty, and it is safe to say that all the minerals will be reserved in any future deeds of confirmation granted by the United States, and mineral discovered on these grants is open to location as on Government land. So far as the title is concerned for either of these descriptions of grants as agricultural or grazing land it is perfectly good, and purchasers may invest in them as such with perfect safety, using the usual precautions of seeing that the land is correctly described in the conveyance, and that the sellers have a correct claim of title, and are the *bona fide* owners.

4. *Indian Reservations*.—These are portions of land reserved and set apart for the different tribes of Indians still in the Territory, and may be subdivided into two classes—First, those set aside for the Pueblo or civilised Indians (so-called). Secondly, those where the still uncivilised tribes are kept under military surveillance, such as the Navajoes, the Apaches, and others.

5. *Military Reservations*.—These are portions of land set aside for Government military forts, where troops are located to keep order among the last-mentioned class of Indians. The minerals on Indian Government reservations are not open to public location; and parties who in face of the fact have no located claims have no valid title whatever. The minerals on confirmed grants can only be legally acquired by arrangements with the grant-holders. Those on unconfirmed grants may be located and held, but no patent can be obtained from the Government so long as the grant is unconfirmed, and only then if the Government reserves the mineral. [The Government map accompanying the letter clearly designates each description of lands above named, but, of course, cannot be reproduced.]

Let me now say a few words as to the *mining laws* of the territory. All Government land is open to location as mineral land, provided it can be shown to be such. These mineral lands may be classed as placer ground, ground containing mineral lodes, and coal lands. PLACER GROUNDS are those which contain gold, &c., in a free state in the gravels or alluvial deposits, and may be located as such in blocks or claims of 20 acres each; but no person or association of persons can hold more than 160 acres in one body. LODE OR VEIN CLAIMS cannot exceed 1500 ft. in length, nor 600 ft. in width—that is, 300 ft. on each side of the vein—nor can they by any local law be narrowed down to less than 50 ft. in width or 25 ft. on each side of lode. The length cannot be changed. On making a location, it must be properly staked or marked off by monuments at the point where mineral is found and at each corner, and midway on each side and end.

The location notice must be explicit in its description, and mineral must be shown in place that is in the solid, and the location notice recorded in the county clerk's office within 19 days. When these requirements have been met, the locator has the remainder of the year in which the location was made, and one year additional to do the legal amount of \$100 worth of work to hold his claim. Placer claims come under the same law as to the amount of work on each—160 acres. This is a very unfortunate law, and strenuous efforts are being made to have it altered, as it enables prospectors to cover a whole

section of country with location notices, and do no real development for nearly two years to the serious injury of the country.

PATENTS can only be obtained after \$500 worth of work has been done on the claim, and while this whole amount may be done in any one year Government only requires \$100 worth of work per annum, which is tantamount to allowing five years before applying for a patent, and even then it is at the option of the owner to apply or not, and he may continue to hold for an indefinite length of time without a patent, so long as he expends his \$100 annually. One reason why many persons do not take out their patents is that so long as their claim is unpatented the title remains in the Government, and consequently not taxable; but after being patented the claim becomes real estate, and is taxed as such. Improvements, however, such as machinery, on unpatented claims can be taxed as personal property. To entitle one to the full benefit of their annual \$100 worth of work, they must within 30 days after the expiration of each year file with the county clerk "a proof of labour" under oath, certifying that that amount of work was done in the previous year. Failing to do this will in this territory render the claim liable to be relocated by other parties, or "jumped," as it is technically called.

COAL LANDS must be located as such. The Government price varies from \$10 to \$20 per acre, according to their distance from railroads in actual operation.

TUNNEL SITES.—These are permitted for the discovery of what are termed "blind lodes," and while a tunnel can only *per se* hold the ground actually opened, yet it conveys the right to all lodes discovered in its course for 750 ft. on each side of the centre of the tunnel not previously known on surface. These tunnels may be driven 3000 ft., and to be held must not be allowed to remain unworked six months. Having thus given as briefly as possible the status of our different descriptions of lands, and the chief points of our mining laws, I will in my future letters take up each of our leading mining districts in detail, giving their location, shipping facilities, character of their ores, so far as it can be done in a news-paper article.

JOHN ROBESON, Mining Engineer.

Las Vegas, New Mexico, Dec. 23.

TIN MINING IN NEW SOUTH WALES.

SIR.—On the first discovery of tin ore here the alluvial, or stream tin, was first worked at naturally—as being best understood by old gold miners, and also most profitable—but there have also been so many surface discoveries of lode tin, whilst washing out the other, that attention is now being turned to that, and as you will see by the subjoined official report of Mr. W. H. Sree (the Inspector of Mines for the Emmaville, Vegetable Creek division), whom I know to be a painstaking and careful mining inspector, there seems every reasonable prospect of our lodes being both permanent and highly profitable, although, as this is a new kind of industry with us, we shall probably find a good deal to learn as to the best and most saving way of heating the ore when raised.

EMMAVALE, Nov. 15.

I have inspected the principal lode tin mines in this district, including those at the Gulf, Mole Tableland, &c. Some of these lodes are several feet in width, and contain a large percentage of tin ore. Of late a great impetus has been given to lode mining in this district, due principally to the high price of tin and the decrease in the yield of tin ore, out of the former rich but shallow alluvial workings. Prospecting for tin lodes is now extensively carried on, and several rich lodes have been late discovered, and are now being tested and developed. In my last report on the tin mines of the Vegetable Creek district I drew attention to the necessity there existed of thoroughly prospecting the tin lodes of Mole Tableland, the Gulf, &c., believing that on their richness and permanency (in addition to the deep alluvial lodes under the basalt) would depend the future and permanent prosperity of these tin fields. I again repeat my opinion then expressed, and I am glad to be able to report that some of the tin lodes which have been recently discovered, present favourable appearances of permanency, and that ere long batteries for tin ore crushing purposes will be erected in different parts of this district, the consequence of which will be the establishment of an extensive and lucrative lode tin mining industry. Quartz leaders, with veins of tin ore, have been discovered at (Cadel's) Vegetable Creek Tin Mining Company's property, and tin lodes have been opened at the Grampian (Hall and Company's) property, also tin lodes have been opened at Tent Hill, Mole Tableland, the Gulf, Silent Grove, Rocky Creek, Deep Water Creek, in a northerly, easterly, and westerly direction for many miles.

One of the most important discoveries lately made is the Ottery lodes (Reid, Hall, and Co.), situated about five miles north-easterly of Vegetable Creek, and about two miles from the Glen Smelting Works, Tent Hill. The Ottery lodes occur in porphyry on an oblong hill; they can be traced on the surface for several hundred yards, and by surface indications there are at least four distinct lodes running parallel with each other. On one of these lodes a shaft 90 ft. in depth has been sunk, laying to view a lode 4 ft. in width, with well-defined walls, the lode being rich in tin, and intermixed with iron and arsenical pyrites, wolfram, blonde (zinc), and galena. About three weeks ago Messrs. Reid, Hall, and Co. discovered some large lumps of oxide of tin ore on the surface on the western part of their property. One of these specimens weighed over 2 cwt., and I believe it is the largest and richest oxide of tin specimen ever found in New South Wales. It is the intention of Mr. Reid to forward a large specimen of this to the Amsterdam Exhibition, and on their return to New South Wales present them to our Museum of Mines. In the immediate vicinity where these specimens were found trenches have been cut, and a lode discovered containing very rich ore. A shaft is being sunk on this lode (known as Gossan lode), which is now down 35 ft., showing the lode about 3 ft. in width. There is a large quantity of tin ore obtainable near the surface, and the natural facilities for the economical and systematic working of said lodes are excellent. Through Mr. Reid's kindness I have been enabled to forward a large specimen of tin (oxide), and also specimens from all the different Ottery lodes. The lodes have also been traced into O'Donnell's Mine, south-westerly of Reid, Hall, and Co.

Butler's lode (Dan O'Connell's) is situated about two miles westerly of the Dutchman's lode, on a rugged granite range between Glen Creek and Mole Tableland, and about 12 miles northerly of Vegetable Creek, and is next to the Ottery lodes, one of the most important rich discoveries in this district. The back of the lode is from 7 to 9 ft. in width, and can be traced for a considerable distance in a south-west and north-east direction. A shaft is being sunk, and is now down 25 ft., but the width of the lode is not yet determined, as one of the walls has not been reached, but at the time of my inspection it could be seen across the shaft, which is a little over 3 ft. wide. The tin is associated with mica-schist rock—formation granite. There are good natural facilities for working this lode on tunnel; there is a good site for a crushing plant close to the mine, and water, as I have already stated, as well as firewood is plentiful. About 1½ cwt. of specimens from this lode were forwarded by me to the Museum of Mines. A new lode was discovered yesterday by Thos. McGuiness and Co., about 12 chains north-westerly of Butler's lode, out of which some extremely rich specimens of almost solid tin were obtained from the surface.

The Dutchman's lode has been sunk on to a depth of 95 ft., but at the time of my inspection very little could be seen of the lode, as the shaft and nearly all the surface workings were full of water, but I was informed that the lode was 1 ft. in width at the lowest depth. A tunnel driven from the eastern part of the mine at the lowest possible level would drain the water, and the mine could then be economically worked. Currow's lode is a parallel running lode in near proximity to the Dutchman's; their shaft is now down 185 ft. Some rich shoots of tin ore were gone through in the sinking of said shaft. Tin is visible in the lode at the very lowest level. The shaft, however, is small and very rough, which in its present state is not likely to facilitate the speedy raising of a large quantity of ore. The lode can be traced for a considerable distance on the surface. The company are sinking a new shaft for their future main shaft, near which it is intended to erect a battery. This mine if once properly opened out should become very valuable.

The Bark Flat Lode (Reid, Crane, and Co.) is situated on a hill about 15 miles north-east of Vegetable Creek. The lode is about 3 ft. wide, 1 ft. of which is rich in tin; greatest depth 40 ft. Four tons from this mine were crushed, and yielded nearly 2 tons of 70 per cent. ore. The lode can be traced over 20 chains in length on the surface, where in parts it shows 4 ft. in width. About 1½ chains from this lode, in an easterly direction, a parallel-running lode, with coarse tin, is visible on the surface, but nothing has been done in testing this lode as to its permanence.

The Ferguson lode (Bark Flat Creek) is about 2½ miles distant from Reid, Crane, and Co.'s lode. Very little work has been done to test the value of this lode. The property is, however, well worth prospecting, as will be seen by the large specimen I forwarded from Ferguson's lode to the Museum of Mines. The Wallaroo lode, distant about 4 miles from Ferguson's, is very rich in tin-bearing granite. The lode, although 3 ft. wide, carries rich tin for about 1 ft. in width. The lode is opened in several parts on the surface, which system of working is likely to create a good deal of trouble through the accumulation of surface water during wet seasons.

The Ferguson lode (Bark Flat Creek) is about 15 miles from Vegetable Creek (Mr. Hugh Marshall, manager), has a well-defined lode, averaging at the lowest depth, or 100 ft. level, about 3 ft. in width. The lode has well-defined walls, and like ore of the Ottery lodes, contains iron and arsenical pyrites, blonde, and probably silver; also wolfram. There are over 200 tons at grass. The Torrington lode's greatest depth is 65 ft. Extraordinarily rich tin deposits were obtained near the surface, and the lode is now sunk on to two different parts containing rich ore. A five-stamp battery is on transit to the mine, and on its arrival will be immediately

This shoot of rich tin ore is probably a spur to a main lode, and worthy of being thoroughly prospected.

At Silent Grove a new lode has been opened, named Antonia's lode, within a short distance of the Silent Grove Company's property. Tin lodes have also of late been opened near Deep Water.

This report, however, only deals with one of, although, perhaps the principal centre of our tin-bearing districts, as lodes are known to exist for 30 to 40 miles in other directions, so that there really seems to be a great future for lode tin mining in New South Wales, especially bearing in mind that tin is also known to exist in the west, south-west, and even on the eastern coast of the colony at distances of several hundred miles apart.

At one of the old alluvial gold diggings—abandoned 20 years ago—the lower part of the creek, where the tailings washed down to, is also rich in alluvial tin, the old miners being of course ignorant as to what it really was; but as it requires about six granite bars to be cut through, so as to secure a fall of about 30 feet into the river, neither the scientific (?) knowledge for such a cutting, nor the capital to attempt it (2000/), appears to be possessed by the present owners, and so it lies idle, although it is known that all the water holes between the bars are also rich in alluvial gold, and Captain Charles Thomas—a well-known Cornish mining surveyor—on visiting and examining it, reported that the profit would be immense as compared with the outlay; "but," said the prudent (very) capitalist—to whom the report was made, and proof given of the sufficiency of the fall—"suppose it should not pay so well as you think, eh?" and so it lies unworked—New South Wales all over.

At Tasmania lately, a large gold-bearing reef was opened up, but proved so poor, that it was about being abandoned, when a change was noticed in the formation, and it turned into a tin-bearing lode—the first instance of the kind I have heard of in the colonies.

Sydney, Nov.

R. D. A.

AUSTRALASIAN MINES.

SIR.—In the "Notices to Correspondents" in the Journal of Sept. 30, "Nemo" enquires what has become of Imperial Crown, Golden Crown, Sir John Moore, Winter's Freehold, Moome's Reef, and Australasian Mining Companies. The enquiry only caught my attention just as the mail was closing, but I subjoin a few particulars:—

Imperial Crown, Golden Crown, and Australasian Mining Companies.—These were companies, named thus, floated here during the mania of 1871, which have utterly collapsed since; but it is just possible that there may be claims of the same name in Victoria or Queensland—still at work—as the titles are just such as catch the ear in time of excitement.

Sir John Moore.—This was an utter swindle from the first; it utterly failed, and the ground now lies idle. Of course, it is possible there may be gold in it, as it lies in the line of a proved auriferous country, but I would not spend sixpence on it.

Moome's Reef.—Never heard of it, and fancy it must be a misprint, as it is not a native name.

United Freehold.—This is the name of one of the best known of the Victorian mines, and also one of the richest of them, but I do not know whether it is at work now or not. If your enquirer writes to the secretary of the School Mines, Ballarat, Victoria, he will doubtless get the fullest information from him.—Sydney. A.

THE AUSTRALIAN LABOUR MARKET.

SIR.—I observed the other day in the columns of your contemporary, the Times, a letter from the Chairman of the Tasmanian Main Line Railway, to which, as it is very important, I shall be glad if you will give currency in your widely read and influential paper. It is as follows:—

Our manager writes: You will note by the newspapers the highly satisfactory financial condition of this colony, but labour is very scarce and high-priced. The worst masons and bricklayers receive 15s. per day here now, and 21s. in Sydney; carpenters, 12s. to 20s.; labourers up to 12s. per day; 8s. is a common wage for a very inferior quality of labour. I have been obliged to raise the wages of artificers, and daily expect the repairers will want 1s. 6d. more per day, which I must necessarily give. Till lately it has not been the policy of the Tasmanian Government to encourage immigration, and the increase of the population has been very little; but they seem now to be alive to the progress the other Australian colonies are making, and are offering inducements to emigrants to go to the colony.

The demand for miners and other hands is nearly as urgent, and wages are nearly or quite as high in South Australia and the other Australian colonies as in Tasmania. What a pity it seems to be, therefore, that more good hands from the mining and other districts (especially Cornwall and Wales) of this country do not go thither. Thousands of them would readily obtain there congenial employment, very liberal wages, and comfortable subsistence, while not a few of them, by good conduct, steady industry, and thrift might reasonably expect in due time not only to greatly better their position, but raise themselves in the social scale. The opportunity to proceed to the colonies is now almost constant, the passage money is not a large sum, and the time occupied in making it has been much shortened—say, by steamer to about 45 days.

The English Government itself, one would think, might expend money with a much less adequate and satisfactory result than by assisting 1000 able-bodied Irish labourers (even giving them, as far as absolutely necessary to do so, a free passage) to land themselves in each of the seven Australian colonies. I believe they would all be offered employment there in the course of a very short time after landing.—Jan. 17.

AUSTRALIA.

BRITISH COMPANIES, AND THE MANAGERS OF THEIR FOREIGN MINES.

SIR.—Allow me through the medium of the *Mining Journal* to make a few remarks concerning liability companies and their appointment of managers for foreign countries, particularly so the South American Republics. During my residence on the coast of Chili and Bolivia I have known the formation of several English companies, not only for mining, but several other industries, but the subject on which I propose to make a few remarks refers to mining and general business connected therewith.

Invariably on the formation of a company our capitalists not only prefer, but strictly adhere to the principle of sending out a manager of their own selection (often a man of little or no experience) being thoroughly convinced that such a man alone will do them justice by working their mines and managing every branch of business connected therewith as if in England, where they have to manage mines only; but when you take into consideration the various branches connected with an establishment on the West Coast, which are mining, smelting, purchase of copper ores, purchase and sale of coast merchandise, mining and commercial laws, shipping, accounts, and last but not least, a partial knowledge of the Spanish language, capabilities requisite and indispensable, to which I may add a thorough man of business to manage successfully, I am persuaded that every right thinking man will see the necessity of getting a competent manager to ensure success by selecting a man able to cope with the various branches which forms such an establishment.

I will not attempt to quote the number of premature liquidating judicious appointments have caused, but simply call the attention of your readers to the Tocopilla Copper Mining and Smelting Company, which was formed to purchase and work mines, with various other branches of business in the Tocopilla, Bolivia, some two years ago, which, if one can judge from reports and appearances, will ere long share the same fate as many other mismanaged establishments. On my visit to Tocopilla some little time ago I was surprised to see the change during my absence of a few months when the Bellavista establishment was full of activity, smelting with two and sometimes three furnaces, and floors well filled with ore; but now it is quite the reverse, the smelting is done by one furnace only, and scarcely ore enough to work full time. This was one of the most profitable branches when the former owners, Messrs. Jose, Odgers, and Co., purchased ore from owners of small mines, often paying the value in merchandise, so that the owners made a double profit, the present manager having lost that lucrative business, simply by not being possessed of the requisite knowledge to treat with sellers by offering just marketable value for their ores. The same lack of experience shows itself in the different departments, including mines. This plainly shows the Tocopilla Company have made the same mistake as many others, and the same fate awaits them if the present state of affairs are not soon put a stop to.

The present financial year should have been a profitable one, judging from the prospectus and report of the present manager, who inspected the property for the purchaser, which might even have been unintentionally exaggerated in the desire to gain the position he now holds with so little advantage to the company. OBSERVER.

Tocopilla, Nov. 27.

COLORADO—PROFITABLE MINING.

SIR.—In looking over the summary of news in the year past in the Denver papers, I am pleased to notice that the views I have entertained and given expression to through your columns as the result of my late visit to that wonderful mining region have been fully confirmed. The importance of the statistics as given in the Denver Republican of Jan. 1 of the yield from the mines in this prolific State can but confirm the reliable information so practically demonstrated by the magnificent display of Colorado's wealth at the late Mining Exposition, and an increase of over \$4,000,000 in the year's product of the precious metals is proof positive of the stability of the mineral resources of the State. That the prosperity of the mining interest gives a tone of success to all other industries of the State is only to be looked on as a natural sequence of events, and the results of profitable mining. The few enterprising miners who are engaged in developing the mineral resources of Colorado, and whose combined efforts have added to the world's wealth over \$26,000,000, or over 5,000,000/- sterling of new money, and that distributed throughout a small community, can but have the effect of increasing the wealth and prosperity of all who come within the radiating influence of this newly-found treasure.

It is but natural that the district papers should indulge in what may be termed a little gush over the unexampled prosperity of the State during the last year. It is not merely that population has enormously increased throughout the chief centres of mining, but that all kinds of business and industries incidental thereto have followed suit. To read over the summary of the year's progress of Denver, the capital city, gives an impression, no doubt, to the uninitiated that the new savours of the marvellous; but facts are stubborn things, and the statistics of yields of gold, silver, and other metals cannot be contradicted, or their importance made light of. The following accounts of the yields from the several counties in the State in which mining operations are being carried on may not be uninteresting:—

Mining Products of Colorado for 1882.

Boulder County	\$ 550,000
Chaffee County	225,500
Custer County	705,116
Clear Creek County	2,001,629
Dolores County	125,000
Fremont County	19,960
Gilpin County (Gold Belt)	2,006,516
Grand County	10,000
Gunnison County	600,000
Hinsdale County	275,000
Lake County (Leadville)	17,131,853
La Plata and San Juan	675,000
Ouray County	329,760
Park	283,564
Pitkin	100,000
Rio Grande	310,000
Routt	100,000
Saguache	52,000
Summit	1,150,000
Total	\$26,750,898
For the year 1881, the yield was	\$22,203,508

Showing an increase for 1882 of

The above show very satisfactory results from mining, and although no statistics are given of the actual dividends paid, it may, I think, be fairly assumed that nearly one-third the gross yield can be classed as profits. The output of coal from the various coal mining districts in the State has been nearly 2,000,000 tons for the year. Valued at the pits at about \$4,000,000. Production of coke, total 92,770 tons.

Production of Iron Ores, 1882.

South Arkansas Mine	14,202 tons
Hot Springs Mines	29,190 "
Placer Mines	8,378 "
Silver Cliff Mines	854 "
Grape Creek Mines	801 "
Total	53,425 tons

Production of Iron and Steel, 1882.

Merchant bar, mine rail, &c.	3,883 tons
Pig iron	24,303 "
Castings	2,752 "
Muck bar (4 months only)	1,253 "
Spikes (6 months only)	5,022 kegs, 100 lbs. each.
Nails (4 months only)	16,158 "
Steel ingots (8 months only)	20,939 tons "
Steel blooms (8 months only)	18,068 "
Steel rails (8 months only)	16,139 "

The banks in Denver appear to be also in a very flourishing condition as the following figures illustrate—

Capital stock and undivided profits paid in.	Surplus funds and undivided profits.	Loans, drafts, and over drafts.	Deposits.
First National	\$200,000	\$ 38,953	\$ 2,160,374
German National	100,000	195,111	1,009,036
Colorado National	100,000	126,678	945,970
City National	100,000	173,508	795,922
State National	120,000	3,161	136,523
Union Bank	100,000	10,000	200,000
Exchange Bank	100,000	82,000	250,000
Denver Bank	50,000	not obtained	270,000

Totals for the year 1882 \$870,000

\$ 754,338

\$ 4,026,409

\$ 3,396,198

The assessed valuation of various kinds of property throughout the State is given at the sum of \$104,440,683, showing a rapid increase from the year 1878, when the assessed value was given at \$43,072,648.

The increase of population throughout the State has been remarkably rapid—thus, in 1870 the population throughout the whole State was only 39,864, in 10 years, to 1880, it had increased to 195,234, or an increase in the 10 years of 155,370. Since 1880 the population of the State is said to have doubled. Arapahoe county, which is given only 33,607 population in 1880, now has at least 85,000, Denver (the capital) alone having over 70,000 inhabitants. The railway, commercial, manufacturing, and farming interests all show a similar favourable result of satisfactory progress, and the prospects of the future of this young State may be deemed the brightest.

THOMAS CORNISH, M.E.,

Author of Gold Mining, its results and its requirements.

MINERAL WEALTH OF COLORADO.

SIR.—In my letter to the Journal last October, giving the bullion product of Leadville for the nine months ending Sept. 30, I took occasion to say that the returns for the whole year would exceed those of 1881 by at least 30 per cent. The figures just to hand fully verify my predictions, the gross returns for the year showing an increase of 31 per cent., or \$17,131,853, as against \$13,170,576 for 1881, \$14,187,697 for 1880, and \$10,333,740 for 1879, making a total in the four years of \$54,223,866. The returns for the whole State during the past year amount to \$26,750,898.

J. FITZBRIND.

THE NOUVEAU MONDE MINING COMPANY.

SIR.—Those who embark capital in French companies, "Sociétés Anonymes," as they call them, could hardly be prepared to hear nothing from them from year's end to year's end. They seem to be formed, so far as the English shareholders are concerned, that these latter may grope in the dark. As far back as July, 1881, I certainly did get at the London office (apparently kept up at much expense) a small volume, accompanied by plans and maps, giving a most

glowing account of the property acquired in Venezuela; but from that date to this I have heard nothing further except all sorts of rumours, which leave me in doubt as to whether or not the company has a clear title to the mine they introduced to the public with much flourish. For my part I greatly prefer the English plan of giving "reports" to that of the "Société Anonyme" of giving none. If I do not always get a dividend from English mining companies, know, at any rate, what my prospects are of getting one.

London, Jan. 18.

W. D.

VENEZUELA MINES.

SIR.—To such as are interested in Venezuela mines—the Chiloe Potosi, Callao, and others—I would say obtain and read the report of M. Fortin, the eminent French engineer, who has recently surveyed the country. On this report many French bankers have invested, largely in these undertakings. Information is really not to be obtained in listening to all the reports emanating from Thompson-street and the Exchange; they are too often misleading only. I have it on good authority that there are large districts in Guayana where, independently of alluvial gold and gold reefs, the very surface soil for many square miles would pay for washing were labour cheap and the climate more salubrious. Where negroes and natives can earn 12s. a day by working on the reefs they find it now pay them better than turning up the soil with the sp

hours by the monitor—is estimated to remove from 2 to 4 cubic yards of auriferous gravel, according to locality, and that the monitors may be discharging an aggregate volume of 6000 miners' inches—equal to 102,000,000 gallons in 24 hours (a larger volume of water than is needed to supply the wants of the City of London)—the significance of this small average yield per cubic yard will be fully appreciated. The average value of gravel worked with a steady profit based upon the operations of companies who have constructed ditches of considerable magnitude in California is shown by the following tabular statement:

Name of County.	Average Height of Bank.	Yield per Cubic Yard.
Smartville Claims, Yuba County	112 ft.	9 d.
Yuba River, Nevada County	180 ft.	7 d.
North Bloomfield, ditto	180 to 260 ft.	2d. to 3d.
Gold Run, Placer County	200 ft.	2d.
Colima Hill, Milt County	100 ft.	2d.
La Grange, Stanislaus County	18 to 100 ft.	1d. to 7d.
Patrickville, Stanislaus County	40 to 60 ft.	2d. to 9d.
Dardanelles, Placer County	150 ft.	6d.

Taking 3d. per cubic yard as a basis of successful operations and applying it as a standard of valuation of profitable ground, a bank 45 ft. in height, should yield at the rate of 1052.7-10 per acre.

Hydraulic mining has given birth to an extensive system of artificial reservoirs in the Sierra for the storage of water, and to the construction of artificial water-courses to convey the water thus stored to the scene of mining operations. Were it not for these reservoirs the hydraulic miner would be able to work only a small portion of the year. The natural streams fall in the early part of July, and they continue low until the melting of the snow in the following spring. With the artificial reservoirs built by the hydraulic miner in the high Sierra he is able to continue his work almost the year round, except when frost seals up his ditches. The visitor finds difficulty in believing that the white shaft of water which he sees emerge from the muzzle of the monitor at work has been carried along precipitous cliffs, over deep gorges, and along the flanks of Sierra spurs, a distance of perhaps 50 miles, and that the source is an artificial lake created by the miners' means and industry in some high Sierra valley, possibly at an elevation of 6000 or 8000 ft. above sea-level. The canals carrying the water have a grade of from 4 to 20 ft. per mile, and carry a volume of 2000 to 4000 miners' inches.

The hydraulic mining ditches are wonderful specimens of engineering skill. In many places it is impossible to find room along the precipitous sides of the great ravines for miles, to excavate a canal, or rest a flume. In such places the flumes are literally hung to the cliffs. The Miocene Mine has a flume carrying 3000 miners' inches of water, suspended by iron slings or brackets from the face of the perpendicular cliff. The Yuba River Mining Company's ditch, which carries just as great a volume of water, runs a distance of six miles along the face of a cliff over which the surveyors had to be suspended by ropes 1000 ft. above the bottom of a gorge to establish the line of the flume. In other places deep gorges are crossed by means of inverted syphons. The Spring Valley Company's Cherokee ditch crosses the ravine of one of the branches of the Feather River in this way. The pipe sustains a columnar pressure equal to 800 ft. in perpendicular height, and 12,000 ft. of 30 in. iron pipe, $\frac{1}{8}$ in. of an inch in thickness, is used in making the crossing. This is an engineering feat without its parallel in the world. Before it was undertaken the most eminent English and French engineers had pronounced it impracticable, considering the cost of construction. It is estimated that there are 6000 miles of mining ditches in the State, which have cost a total of 3,000,000. Some of them have been built at an expense of 5000. per mile. The canals of the South Yuba Canal Company are 150 miles long, and cost over 340,000., and to keep the mining ditches in order entails a considerable expense. The hydraulic miner has to maintain a ceaseless contest with the elements—frost and flood, ice, snow, wind and rain. It is estimated that at least 20,000,000. is represented in the capital stock of hydraulic mining property in California, a large portion of which has been expended in the construction of tunnels, ditches, flumes, and reservoirs. The hydraulic miners' ditches and flumes are, of course, employed in diverting the streams from their natural channels. In older countries, where law and custom establish what is known as riparian rights, such a diversion would be impossible. The location and other peculiarities pertaining to the working of the deep gravel deposits of California made it necessary so to divert the streams. What was at first the custom was subsequently recognised by the law, special Acts of the Legislature being passed granting the hydraulic mining companies water privileges unknown in other countries.

It is estimated that at least 20,000 men are engaged in hydraulic mining in the United States, Chinese labour being largely employed in the subordinate work.

The deep placers of California are traceable for 300 or 400 miles. Their continuity within well-defined channels, having a grade varying from 20 to 300 ft. per mile, has given rise to the conviction that they constitute the *debris* of an ancient system of rivers. This auriferous *debris* consists largely of eroded slate and quartz. The deposit varies in thickness from 100 to 1000 ft. In many places it is overlaid with a stratum of lava, which was undoubtedly emitted by Mount Shasta and other now extinct volcanoes in its neighbourhood during a period of great volcanic activity which succeeded the geological period, when the auriferous gravel deposit was formed. Evidences of this great lava flow are to be found all over Northern California and Oregon. In some of the counties in which the gold-bearing placers exist the stratum of lava overlying them is so thick that the only way in which they can be worked is by the drift or vein process of mining. Hydraulic mining is confined chiefly to the counties of Nevada, El Dorado, Placer, Yuba, and Butte, where large portions of the lava-sheet is so thin that it offers little or no obstacle to the process. There are also some large hydraulic mines in Plumas, Calaveras, and Stanislaus Counties.

The character of the gravel formation is shown to great advantage in a hydraulic mine. The upper stratum, for a depth of 100 ft. or so, is loose and friable, and of a rusty appearance caused by the oxidation of iron pyrites, no doubt facilitated by the percolation of surface water through the gravel. The lower stratum of gravel is denser, well cemented, coarser, and of a bluish colour. Owing to this latter feature it is called by miners "blue gravel," and because of the greater proportion of gold found in it, the term "pay dirt" is also applied to it. Occasionally a stratum of pipe-clay will intrude between the upper and lower strata of gravel, and a layer of gravel varying in thickness almost invariably overlies everything.

The gold product of California from the discovery of the precious metal by James W. Marshall, in the tail-race of Sutter's Mill, Jan. 19, 1848, to Dec. 31, 1882, amounted to 240,000,000. Of this sum 184,000,000. is estimated to have been extracted from the auriferous placers, of which amount 41,022,000. has been obtained from the deep gravel deposits by hydraulic mining. The remainder represents the yield of gold quartz mines. Judging by the success which has hitherto attended hydraulic mining operations in the Western States, and looking at the enormous area of unworked ground there known to be auriferous, the suppression or suspension of such an important industry is, a contingency, too remote for present speculation.

P. A. EAGLE.

THE WHEAL SHEPHERDS DRESSING MACHINERY.

Sir.—I notice a letter from Mr. G. Rickard, in last week's Journal, in which he refers to my being at the Shepherds Mine before coming to Pierrefitte. I wish to point out that I never had anything to do with the machinery at that mine, neither was I ever employed there. I have, however, been engaged in an adjoining mine, and have visited the dressing machinery at Shepherds; and I am certain there is no fault to be found in the jiggings machines, though they were not new, and had been in use many years before in another mine. Whatever is wrong with the machines at Shepherds it is not the jiggers. The crusher, however, is too small, and is not capable of fully supplying the jiggers with ore, and consequently it is impossible for them to dress well. This the present dresser knows perfectly well. With regard to the machine put up by Mr. Rickard at this mine, I find they are worse than useless, as they are the means of throwing away the ore instead of cleaning it. I understand he never dressed any lead above 45 per cent., whereas the new machinery erected since

can dress it up to 75 per cent. No doctoring would ever make his machines do that. Before writing to a public journal a man should be quite certain that his statements can be borne out by facts. If those here do not know anything about mining and dressing it is not the writer in question who is able to teach them.

Pierrefitte, Hautes-Pyrénées, Jan. 16. RICHARD DAVIES.

NEW SYSTEM OF WORKING ASHLAR STONE (STONES WORKED AND IN SHAPE), MARBLE, &c., BY MEANS OF QUICKLIME.

SIR.—In working quarries of stone generally the blocks are detached by different means, of which those most in use are—

1.—To make notches by a chisel worked by hand at regular distances in the direction of the cleavage, and to drive into these by hand hammers metallic wedges until a crack is obtained which will effect the separation of the block from the seam, stone or other mineral. This primitive means, apart from being very slow and costly, does not always succeed in detaching blocks in a manner nearly irregular, especially in layers which are hard and compact, where no natural cleavage exists, and pieces are only obtained of different sizes, producing a great amount of rubbish or rubble amounting sometimes to above 50 per cent.

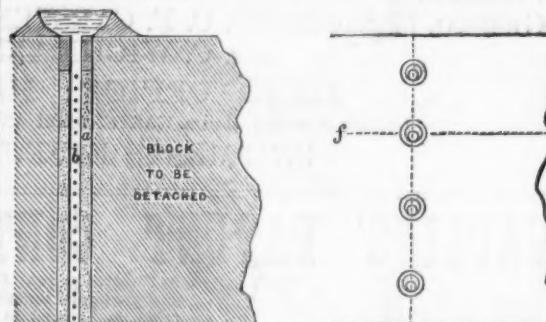
2.—Instead of using wedges to effect the cracks, powder, and other explosive materials are also employed. Independently of the danger that this means presents, it has especially the inconvenience of breaking up blocks and pieces when the explosion occurs, and only rubbish (or small) is obtained.

3.—During the last few years use has been made of boring or cutting machines, which cut by means of movable chisels grooved in the thickness and length of the seam (nicking and curving). This mode gives excellent results so far as small is concerned, but the apparatus up to this date are too imperfect and too costly from their slowness and cost of keep.

4.—Recently borers have been employed, by which holes have been rapidly driven from 6 to 10 ft. deep, but the use of these borers either by steam or compressed air has only had for result the making of bore-holes in a quicker space of time, without relieving the owner of the mine or quarry from the use of wedges or explosives, of which the inconvenience has been already described.

In presence of the different means of working, which are perfectly insufficient and of such a costly plant for the owners, we have for some time made an examination of various experiments, and we have discovered that quicklime produces expansion, and (slakeing) is capable of developing a sufficient power to detach without shock or explosion blocks of the largest dimensions. In this consists the process of which we request a 20 years' patent (brevet). This is the patent.—We produce by hand or by any boring apparatus what-

Vertical Section.



ever holes, *a*, either in one part or in the whole height or length of the block which we intend to detach; we introduce in each one of these holes a metallic tube, *b*, of as small a diameter as possible, and perforated with small apertures in the direction of its length. We place this tube, *b*, against the edge or periphery of the hole, *a*, and in the block in such a way that each one of the small holes of each tube shall be in the line, *c d*, of the fracture which we wish to obtain. We fill subsequently the holes, *a*, with a powdered (or granulated) quicklime, which we stem as strongly as possible, so as to fill these holes as exactly as possible with a compact mass of lime on the side where the perforated tube, *b*, is imprisoned. We close the orifices of the holes with clay in a funnel shape, through which we impart simultaneously water, which, exuding from the perforations in tubes, impregnates the quicklime, and develops its heat, expanding (slakeing) proportionate to the amount of lime, and acting on the whole height of the hole, *a*, and in consequence a very regular separation is produced without shock or explosion, causing breakage in the line, *c d*, and this breakage is obtained in a few minutes without rubbish (small), without any danger, and at small cost. It is evident that the holes, *a*, may have any direction—vertical, horizontal, or oblique, and we prepare damping (or slakeing) by tubes of forms suitable to every condition, either separate or connected by a common (or joint) pipe or tube, by which the water can be simultaneously applied to each hole. We also claim the right of using in the holes, *a*, one or more tubes as may be considered useful.

In conclusion, we claim as our property, and request a patent (brevet d'invention) for 20 years for the application of expansion (slakeing) of quicklime as a means of disintegration (or separating) of blocks of ashlar stone, granite, marble, sandstone (millstone) slates, or, in one word, of any solid body capable of being broken off, split, or divided by means of wedges, chisels, saws, explosives, and especially to replace those of these methods actually in use in quarrying of stone, granite, marble, millstones, and slates in general.

The above is a translation of the original specification for the patent which was granted in 1875 to Mr. G. Warregruz and myself. I may state that our lime process has been practically worked for some years, and I have seen huge blocks of hard rock river asunder from their beds; some of these blocks being 300 tons in weight. This system is invaluable when large blocks are required, and can be worked with safety and economy in many places when it would not be practical to use either blasting powder or dynamite.

Newcastle-on-Tyne, Jan. 15. J. G. CRANSTON.

REDUCTION OF GOLD ORES—THE BRITTEN PAN.

SIR.—At present a good deal is being said about the Improved Britten-Readwin Pans, and what Mr. Readwin calls his secret "mode of preparing quicksilver." Heretofore Britten pans (with one or two exceptions) have only been used in crushing patches of rich ore taken from a few of the gold-bearing reefs near Dolgellau, in North Wales. Mr. Readwin has attached some outside appliances to the Britten pans, of little or no importance, but he has not in any way improved or altered the pans themselves; and without a very great alteration in the pans and in the crushing pestles they will never come into general and practical use or take a place amongst the quartz-crushing and amalgamating machines of the day. In three months' constant working the points of the pestles and the bottoms of the pans are worn out, and both rendered unfit for further use. The ore before being put into the pans has to be crushed as fine as peas, and then not more than 3 cwt. of it or of tailings can be got through a pan in 24 hours. Fancy setting up a mile or a couple of acres of improved Britten-Readwin pans to do the work of a single battery of stamps. In mines where rich bunches of ore are occasionally met with and when it is not judicious to mix them with the ordinary ores, one or two Britten pans are convenient enough kind of machines to have. When carefully attended to and not over-fed they save the greater portion of the free gold in the ore. In over-feeding, or on a few pieces of ore the size of pigeon eggs getting into a pan, the point of the pestle is caused to leave the groove in which it turns in the bottom of the pan, and then the pestle goes round, jerking, pitching and splashing, and in a few revolutions half the contents of the pan are thrown out.

Several modes of preparing quicksilver are known that give it

a greater affinity for taking up gold, and partially prevents it from flouring and sickening when brought into contact with fractious ores, but none of them are lasting or permanent in their effects. Crookes' sodium answers the purpose perhaps best of any. It is easily applied and has an instantaneous effect, which lasts for a longer or shorter period owing to the nature of the ore that is being operated upon.

Hunley, Bridge of Dee, Aberdeen, Jan. 16. F. ANDERSON.

IMPROVEMENTS IN AMALGAMATION.

SIR.—It appears to me that in attempting to improve amalgamating machinery we should advance from the copper plate to something better, not return to blankets, which, at least, are a defective mode of gathering the precious metals, besides being very tedious and troublesome to manage, requiring much care and attention. Copper plates, whether electroplated with silver or not, as used in ordinary sluices, are defective both on account of the wear referred to by your correspondent, and other causes that will hereinafter be set forth.

The principal defect of plates is attributable to the fact that they take the precious metals by a forward movement only. The finer particles of the precious metals are thus not afforded proper facilities for adhering to the plates as the flowing sands impinge on them and propel them forward, carrying a considerable percentage thereof into the waste. Besides this defect and the wearing propensity above referred to, there is another objection against relying solely on copper plates as a means for taking the precious metals. It is necessary to apply quicksilver to the plates occasionally to keep them in proper condition. If too much be applied, the surplus quicksilver will, of course, wash off the plates, carrying with it a considerable percentage of the precious metals, which will be washed into the waste unless taken in some suitable device situated below. If quicksilver be applied too sparingly the plates will be too dry, and in this case a considerable percentage of the precious metals will be washed over the plates without being amalgamated, and will go into the waste if there be no better means provided to take it. So you readily perceive that it requires an experienced hand to work plates properly, and even then the loss will be considerable.

Copper plates of proper construction, electroplated with silver, are an important auxiliary in taking the precious metals. To serve the above purpose the plates should be constructed with grooves at right angles of sufficient depth to hold and retain quicksilver, with which they are filled, or partially filled. The construction should be such that the precious metals will be brought in contact with the plates or quicksilver, one or both, as they flow onward, the object being to at least partially amalgamate them. If either the plates or quicksilver take and retain them, all right; if not, they will be better prepared by reason of having been amalgamated, to be taken by a device situated below, that we will now briefly describe.

Grooved Riffles.—This is the only known device constructed specially for taking the precious metals by a backward movement. The construction is such that but little gold or quicksilver can pass over them, and it is believed that they will come nearer taking all than any other device that has ever been gotten up for the same money, or we may say, regardless of price. They are simple, cheap, and effective; any surplus quicksilver that may come into them will cause an equal quantity to flow out through a pipe where it can be caught in some proper vessel, from whence it may be supplied by hand to plates above, or by means of very simple device, any desired quantity of quicksilver can be distributed on the plates automatically, and when the plates and grooves above described become charged or filled, the surplus quicksilver will flow over and finally be taken in the grooved riffles from whence it will be again supplied to the plates. A circuit is thus kept up automatically, the same quicksilver being supplied to the plates over and over again. In this case the plates will be used as an auxiliary to cripple the gold by amalgamating it to a greater or less extent, and thus cause it to be more readily taken by means of the grooved riffles situated below.

The plates should be so constructed that there will be but little wear of the portions intended for amalgamating. But as before stated, it matters but little whether or not we retain the precious metals on the plates provided we can amalgamate them wholly or partially. The grooved riffles will render good service in connection with, or without, machinery; but some simple machinery for keeping the sand overlaying the quicksilver loose will render them more efficient. In hydraulic mines they would, with the aid of this machinery, answer a splendid purpose for taking what is known as rusty gold. These riffles will also render excellent service without the plates.—Washington, U.S., Dec. 23. BRYAN TYSON.

THE TRADE OF THIS COUNTRY IN 1882.

SIR.—Having had to analyse the Board of Trade Returns, 1882 for my own purposes, and to arrange the chief items in descending order of their values, I have thought that their publication might interest some of the readers of the Journal. Most people seem satisfied with the (generally) meagre accounts of these amazing returns given in the newspapers. Few people buy the Returns for their own examination, and consequently they are for the most part unaware of the relative aggregate values of the 80 chief imports and the 50 chief exports, upon which the whole welfare of the kingdom depends. Briefly these astounding ledger totals may be reviewed as under:—

1.—The grand totals of declared values.

2.—The declared value of imports and consumption of the principal articles of foreign and colonial merchandise.

3.—The declared value of exports of the principal articles of foreign and colonial merchandise.

4.—The declared value of exports of the principal articles of British and Irish produce and manufactures from the United Kingdom.

5.—The real value of the imports and exports of gold and silver bullion and specie.

6.—The tonnage of vessels entered and cleared within 1882.

(1.)—The grand totals of declared values (including gold and silver): Imports, 435,000,000.; exports, 228,000,000.; grand total, 723,000,000. sterling.

(2.)—Values of imports and consumption (except bullion), expressed in thousands sterling: Corn and flour, 63,192; raw cotton and cotton manufactures, 48,602; wool and woollen manufactures, 34,895; sugar, 24,884; wood and timber, 17,167; silk and silk manufactures, 14,902; tea, 11,363; butter and butterine, 11,339; living animals, 9,271; seeds, 8,604; iron and steel, 6,947; bacon, 6,224; wine, 5,463; leather, 5,257; coffee, 5,189; cheese, 4,742; jute, 4,336; copper, 4,025; oil, 4,020; hides, 3,740; flax, 3,608; rice, 3,297; hops, 2,858; caoutchouc, 2,729; indigo, 2,610; tin, 2,547; tobacco, 2,462; eggs, 2,381; tallow and stearine, 2,255; hemp, 2,164; gloves, 1,917; bark, 1,908; spirits, unsweetened, 1,874; lard, 1,862; beef, 1,773; preserved meat, 1,731; petroleum, 1,704; glass, 1,680; oranges and lemons, 1,668; fish, 1,659; hams, 1,523; chemical manufactures, 1,518; oil seed cakes, 1,459; pyrites of iron or copper or sulphur, 1,442; currants, 1,361; rags, 1,282; nitrate of soda, 1,270; lead, 1

painters' colours, &c., 1339; pickles, &c., 1338; hats, 1316; paper, 1306; refined sugar, 1218; bags and sacks, 1179; books, 1172; glass, 1086; telegraphic wires, &c., 1041; caoutchouc manufactures, 1005; stationery, 882; spirits, 756; carriages, &c., 700; tin, 579; lead, 578; salt, 569; rags, &c., 526; harness, 485; soap, 458; brass manufactures, 444; cordage, 428; animals, 407; plate, 352; butter, 219; candles, 135; zinc (or spelter), 126; cheese, 65.

(5.)—The real value of imports and exports of bullion and specie. Imports: Gold, 14,375,914L; silver, 9,244,663L: total imports of gold and silver, 23,620,579L.—Exports: Gold, 12,023,804L; silver, 8,965,454L: total exports of gold and silver, 20,989,258L.

(6.)—The tonnage of vessels entered and cleared with cargoes (foreign trade): Entered, 2,009,692; cleared, 2,058,083 tons: grand total, 4,067,775 tons. The coasting trade had entered, 26,135,864; cleared, 23,573,011 tons: grand total of tonnage, 53,775,850 tons.

N.B.—The most stupendous fact of all, perhaps, to be got out of these wonderful returns is that we paid more than one hundred and seventy millions sterling for food stuffs and other articles having to do with our 34,862,438 mouths, and this over and above what we grew at home. In this account wheat figured 34,237,039L, and wheat-flour and meal, 10,631,933L.

T. A. READWIN, F.G.S.

London, Jan. 15.

GOLD AMALGAMATION.

SIR.—It is an accepted rule that anybody who ventilates facts and opinions by means of newspaper columns is a mark for open criticism, and he generally gets it, for the most part unfavourably. Not a bad thing either, for it has a tendency to keep him from rusting, especially in damp nasty weather. Somebody has pointedly said—"Don't prophesy unless you know." Your correspondents Mr. Green and Mr. Kensington seem to have acted contrary to this wholesome suggestion. Mr. Green swooped down on me from the afar. Mr. Kensington attacks me from nearer home, simply by reiterating Mr. Green's assertion that "the Britten pan will not treat mineral if fed continuously." Although very unwell at the time I replied to Mr. Green I thought I had analysed his correspondence pretty closely; but from the little slice of it cut out by Mr. Kensington I find that I did not do it exhaustively. I now see clearly what I ought to have noticed earlier—that the assertion is verbally true. I saw the mental truth only—that is to say, the idea intended for exhibit. I have now, therefore, frankly to admit off-hand from my own long experience that "the Britten pan (proper) will not treat mineral if fed continuously." The notion intended to be conveyed, however, is that the Britten-Readwin pan is equally inefficient. Now, this does not happen to be fact; and, with all due courtesy, I plainly say that these gentlemen's experiences of the last-named apparatus must have been extremely limited, and that they prophesied on this head before they knew. The assertion itself is, in truth, something and nothing. Any amalgamating apparatus will "treat" minerals in some way if worked continuously. The way may be "good, bad, or indifferent." All I say of the apparatus I the most approve of at present is that in connection with something I do to the quicksilver used, I can work it continuously, cheaply, easily, and profitably. I can deal satisfactorily with finely divided and tarnished gold which ordinary quicksilver will not dissolve. My process gets it, and keeps it. Mr. Kensington having pushed my adopted apparatus aside, as he thinks with a feather, introduces a machine of his own designing, which looks very well on paper, and it is not going to have any ill-natured criticism from me. I shall not prophesy before I know how it will act. I may say, however, that the idea is not altogether new to me. I shall be glad to see the machine in operation and successfully. In one respect Mr. Kensington's process differs essentially from mine in that he uses quicksilver, and I use what may be called quicksilver.—London, Jan. 15.

T. A. READWIN, F.G.S.

THE SILVER ZONE AT HARROWBARROW, CALLINGTON.

SIR.—I notice in last week's Journal the letter of "Sceptic," calling attention to the Silver Hill Company and the Silver Zone, and slightly referring to the present starting of the Birmingham and Harrowbarrow Company to work on this zone. I am not at all disposed to question any of this writer's remarks, but simply wish to keep the two enterprises distinct, which I fear this writer's letter unintentionally confounds.

The Silver Hill enterprise is that of driving a tunnel at a certain depth through Kit Hill, and in this driving it was expected by the original promoters of the scheme that 27 lodes would be intersected, and when thus intersected was to be handed over to the company or companies to whom each lode belonged, so that such companies might follow the lodes, and give to the tunnel company a 5 per cent. of the value thus brought to light. I am not aware that the present company have powers to follow a lode after intersecting it, but simply to cut it through and pass on. If lodes can be followed when found by this company I should like to know how far such search can be pursued.

The Birmingham and Harrowbarrow Mining Company, on the other hand, has purchased a sett having five shafts already sunk on the course of the two silver lodes, and the copper and arsenic lode, which together comprises the silver zone already referred to. The future operation of this company is defined when it is stated that the sett extends a full mile along the course of this zone, and that the silver ore is at present in sight in four or five places just waiting machinery and willing hands to bring tons of it to surface, through Bennett's shaft, and equally willing hands to work the machinery constructed at the engine-shaft and Cook's shaft to fetch not only silver ore, but copper and arsenical muriatic to surface. This is a very different enterprise than that of intersecting lodes by a tunnel running across them.

G. S. DOWLING, Managing Director.

Birmingham, Jan. 15.

SHROPSHIRE LEAD MINES.

SIR.—We learn with much pleasure that the rich discovery in the 80 west, at Pennerley, turns out splendidly as they proceed with the laying of it open, so that increased returns may be relied upon. It is generally believed that a very short season of dry weather will be sufficient for the water to drain off again from Potter's Pit. The very day that that is the case the Pennerley portion will be in a profitable position. We are glad to see the manager refer to the preparations for deepening Watson's shaft at Tankerville, and to the cavity in one of the bottom ends. We hope they will soon meet with the junction of the two lodes as they deepen the shaft, and that Tankerville will repeat itself. We have seen Tankerville very much poorer years ago than it is now, and we expect to see large returns there again. The sinking at Bog seems to be going on very successfully, and we shall have some good news from there before the end of 1883.

MINER.

[For remainder of Original Correspondence see Journal.]

THE DEEPEST COAL MINE IN AMERICA.—Pottsville, Penn., claims the deepest coal mine in America. The shaft is 1576 ft. in depth. The cars, holding 4 tons each, are run upon a platform, and the whole weight of six tons is lifted in a little more than a minute by machinery that works as smoothly as a hotel elevator. The output is 200 car loads a day.

VOYAGE ROUND THE WORLD.—An ingenious nautical game has been designed by Mr. J. Banting Rogers, of Holborn Viaduct, which is at once exciting and entertaining. It is a round game in which any number of persons may join, and is played on a large board representing the ocean, suitably divided for counting by knots, and with hazards in the shape of cyclones, collisions, and so on. Logs are kept, watches appointed, and there is a captain of the watch to record distance and perform other necessary duties. Mr. Rogers is already well known as the inventor of the cone-block and rope-rope system of saving life from shipwreck, and other equally important maritime inventions, for which he has received innumerable awards from different societies. The present game embodies, in a most pleasing and attractive form, a simple method of teaching the higher branches of navigation, seamanship, and the rule of the road at sea; showing the inventor's intimate acquaintance with maritime matters. It is intended to combine instruction and amusement, and that object is thoroughly accomplished.

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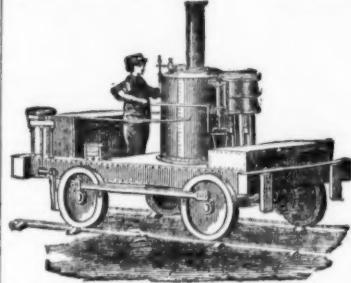
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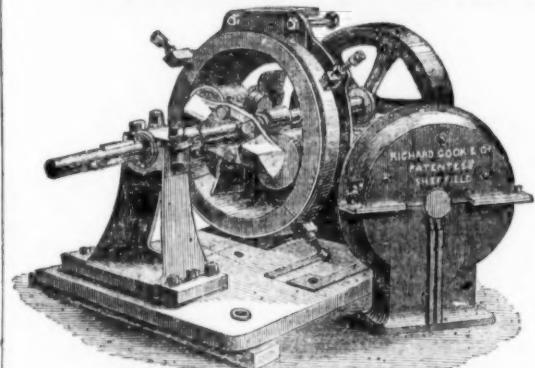
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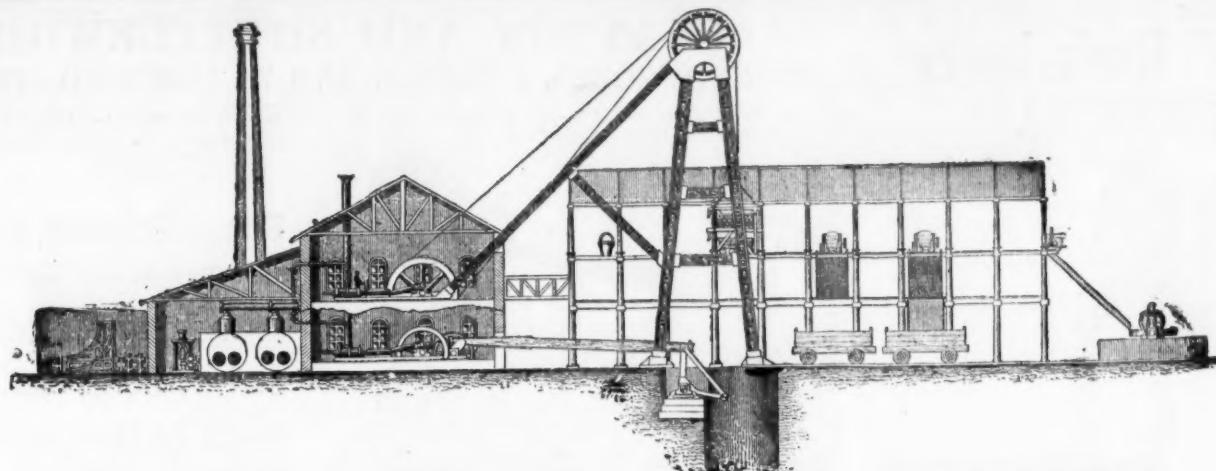
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FOREIGN MINING AND METALLURGY.

The intelligence received with respect to the Belgian coal trade continues favourable; at the same time the mildness of the winter has necessarily exercised some influence upon the general tone of business. Household coal continues naturally the least sought after, but quotations generally have been fairly maintained. In the Couche de Mons the state of affairs is encouraging. Stocks are generally below the average, and deliveries continue to be made on a large scale. Coking coal has become scarce, but some rather important contracts have been concluded at 10s. 8d. and 11s. per ton. Coke is scarce, and cannot be obtained below 15s. per ton. There is little change to report in German coal quotations. All descriptions have been in fair request; at the same time the demand has not shown any extraordinary activity. Coke has been in active request. Complaints have been made of continued want of rolling stock, and upon many railways there has been a block of traffic. Deliveries by water have not been resumed, and great activity has prevailed in consequence upon lines accommodating the various coal basins, and especially that of Ruhr. In the Aix-la-Chapelle district the maximum depth attained by any coal mine is 2,250 ft., while in the Ruhr the depth attained is 1896 2-3 ft., and in the Sarre, 1696 2-3 ft. The port of Hamburg is importing more considerable quantities of coal year by year. In 1881 the receipts of English coal were 1,001,000 tons, and in 1882, 1,013,000 tons, showing an increase of 12,000 tons. Westphalia, again, supplied 475,000 tons of coal to Hamburg in 1882, as compared with 452,000 tons in 1881.

There has been no material change in the Belgian iron trade, the markets having continued quiet. Upon the whole, the general aspect of affairs is not unfavourable, and if work were a little more abundant there would be nothing at all to complain of. Production has been reduced in many works, and this has helped to maintain prices at their present level. Several blast-furnaces have been blown-out, and more than one rolling-mill has been stopped. Pig remains scarce, and as several blast-furnaces have their production engaged until the close of the first quarter of the new year, and several others for even longer periods, producers are enabled to maintain a relatively firmer tone. Blasting-pig, No. 5, has made 37. per ton, with the usual differences of 2s. per ton per number. Iron has been supported at 57. 4s. per ton. Some concessions were made from this price in December, but rates are now maintained somewhat more firmly.

Business has been quiet in the French iron trade, and a little uneasiness begins to be felt as to the future. A meeting of forgemasters was held at the commencement of the month at Valenciennes; it was determined to maintain the rates previously current; but, at the same time, it was admitted that orders had become scarce, and that Paris quotations were tending downwards. This appears to arise from an excessive production. New works have been established in all directions, while those previously existing have been enlarged. In addition to all this the exports have declined. Merchants' iron has made 7s. 16s. per ton; and white refining pig 27. 16s. per ton at Paris. The Longwy group is stated to have employment assured to it for eight months in advance, the contracts in hand representing altogether 120,000 tons of casting pig and 141,000 tons of refining pig. There are now 41 blast-furnaces in activity in this group. There is little change to report in the German iron trade. The demand has been rather weak, and prices have scarcely varied, syndicates having been formed to maintain them. To attain this object it has, however, been necessary to sensibly reduce the production. A contract for 803 tons of steel rails has been taken at Erfurt at 87. 3s. per ton. The German steelworks are generally well employed.

AMERICAN MINING CODE.—As a writer on American mining law the name of Mr HENRY N. COPP is already well known to the readers of the *Mining Journal*, and he has now issued—Washington, D.C.; the Editor. London: Trübner and Co., Ludgate-hill—a new annotated edition of the American Mining Code, embracing the United States, State, and Territorial mining laws, the Land Office regulations, and a digest of the Federal and State Court and Land Department decisions. The circumstance that mines and mining are necessarily closely interwoven with other classes of property, and with other industries, renders it somewhat difficult to determine even with the revised code what precise sections it is desirable to consult for the solution of any given question that may arise, so that Mr. Copp has rendered great service to the mining community in bringing together in one volume all the sections miners are likely to wish to refer to. The manner in which the information is given renders it particularly easy for reference, and as many English capitalists are now interested in American mining property the work will be almost as acceptable on this side of the Atlantic as the other, and may be commended as a concise and explicit outline of the whole subject.

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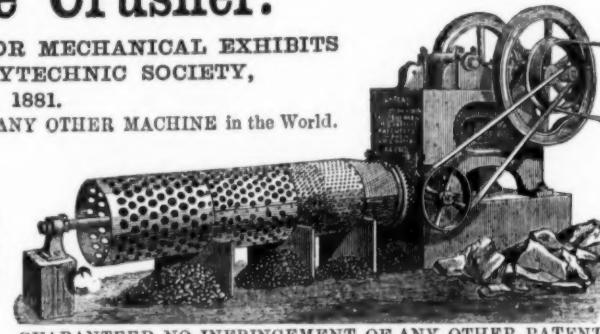
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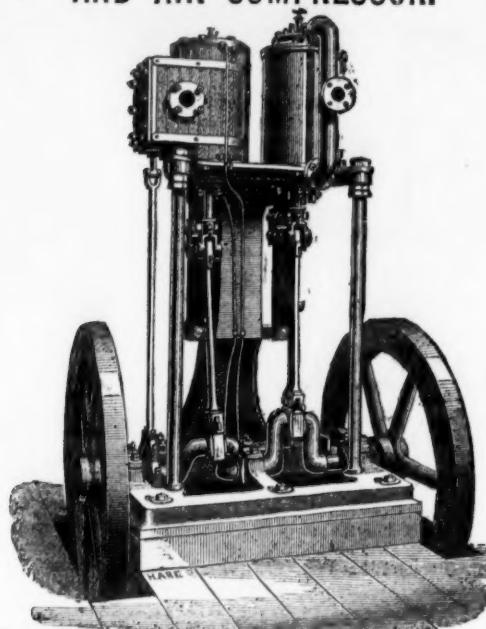
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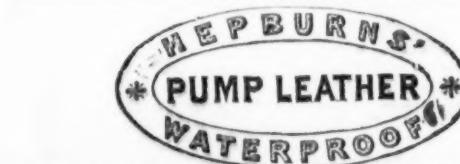
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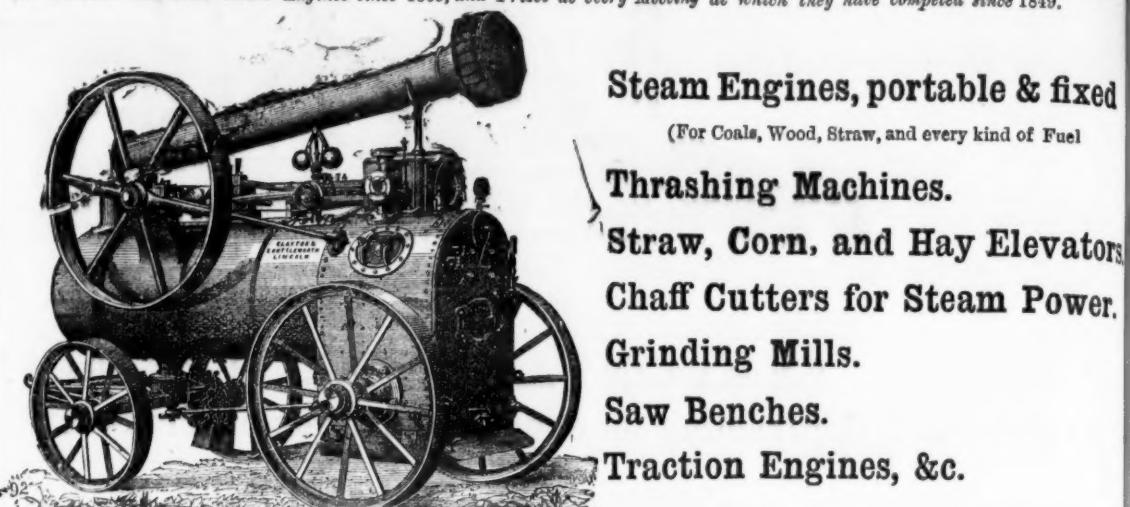
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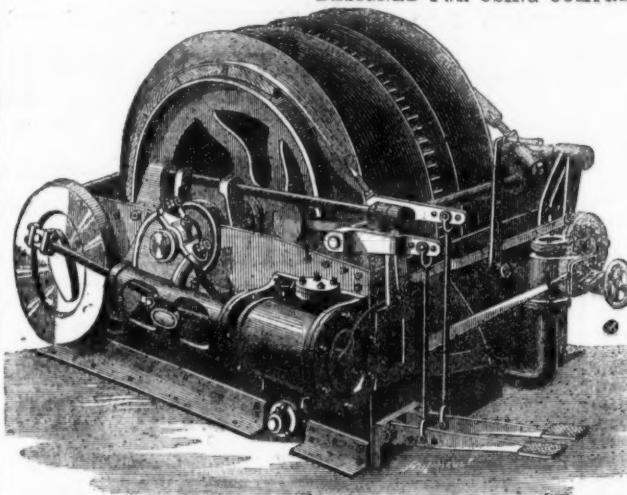
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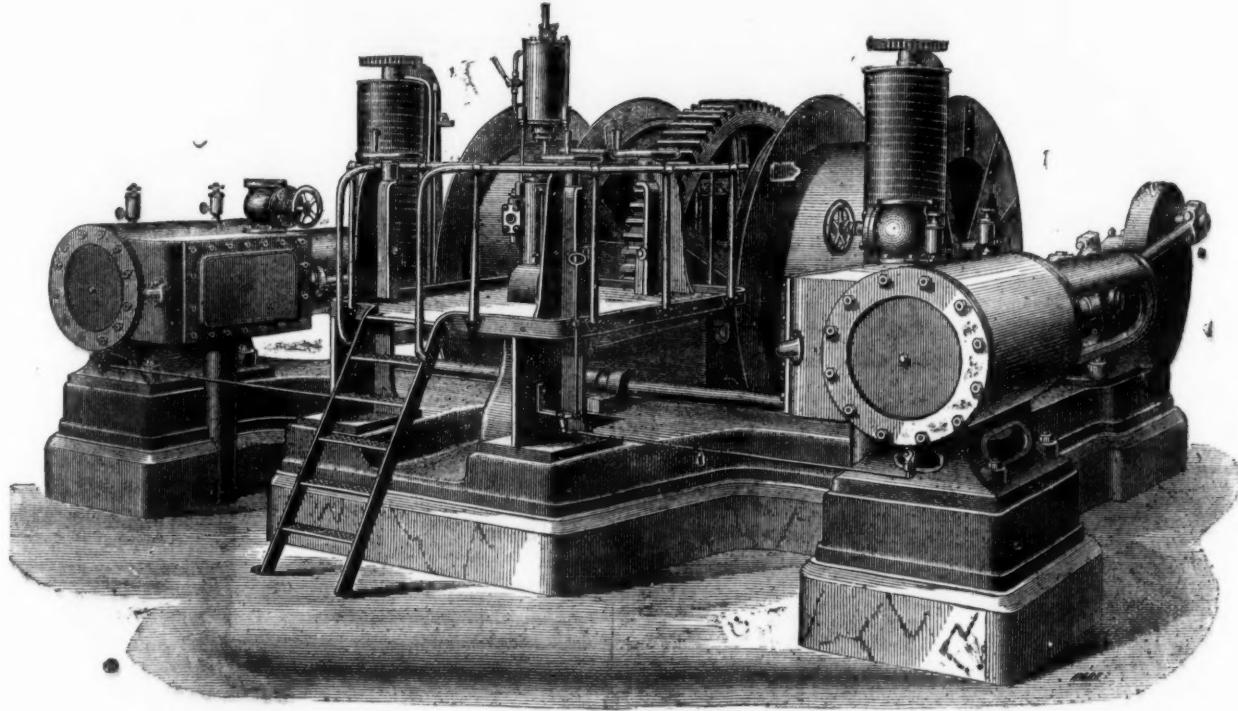
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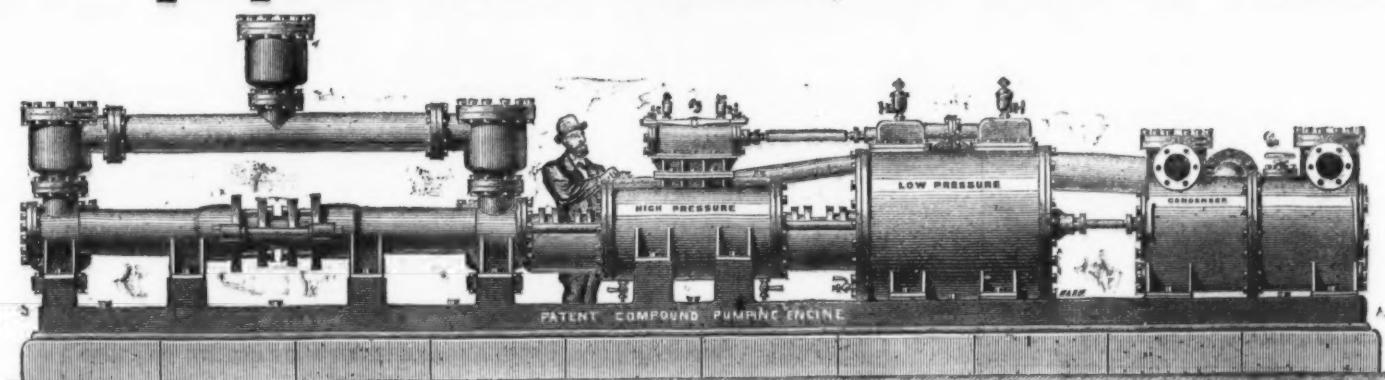


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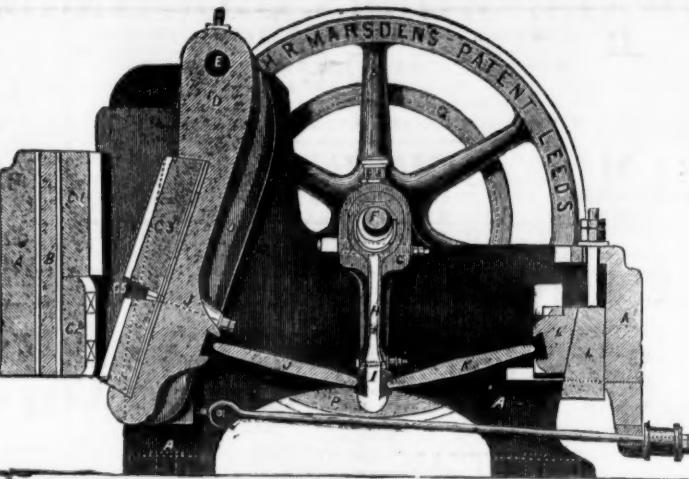
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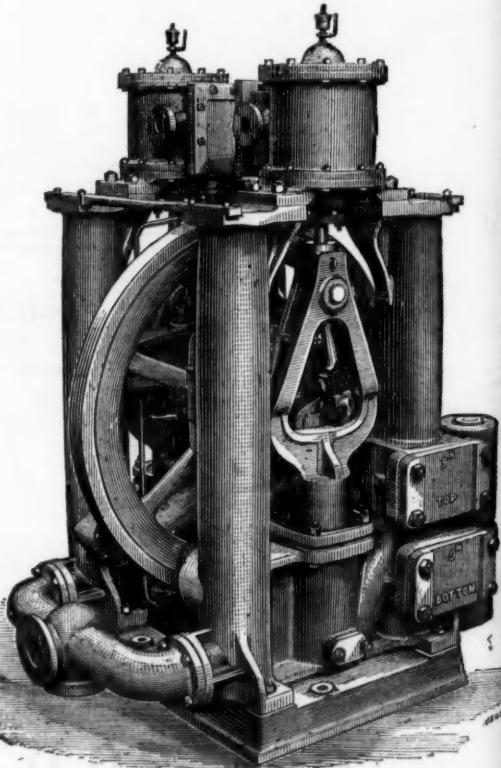
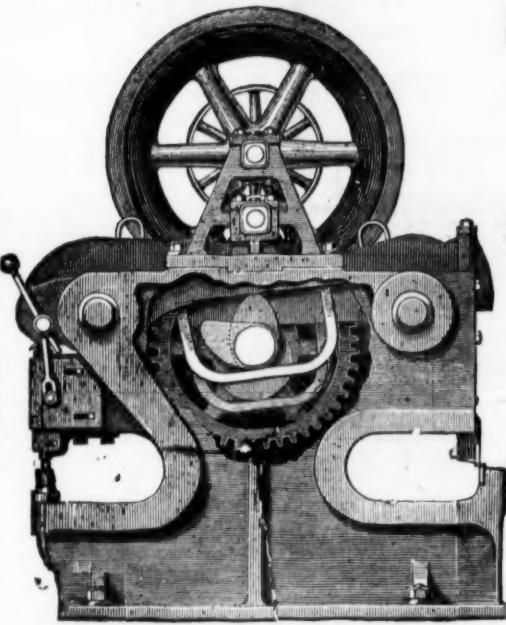
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